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ABSTRACT

A study was conducted to determine the best method for obtaining information on teachers' backgrounds for the Schools and Staffing Survey (SASS). Two alternative methodologies were compared: the collection of teachers' self-reports of their academic qualifications and the use of their college transcripts. While transcripts are assumed to provide more accurate information, their collection and analysis is more complex. The 1990-91 SASS relied on 637 completed interviews with teachers, 592 of whom had transcript information available. Several different kinds of teacher error were detected when the transcript information and self-reports were compared. Item nonresponse was sometimes significant, and some errors of omission were found. Some errors showed bias on the part of the respondent. Some errors apparently simply reflected differences in judgment. However, it was noted that transcripts themselves presented problems, particularly in the amount of work required for processing. It is concluded that self-reports and transcripts each have advantages and disadvantages, and that the determination of the kind of data to collect will depend on the quality and type of data to be collected, the resources available, and such considerations as the amount of burden to be placed on the respondent. (Contains 12 tables.) (SLD)

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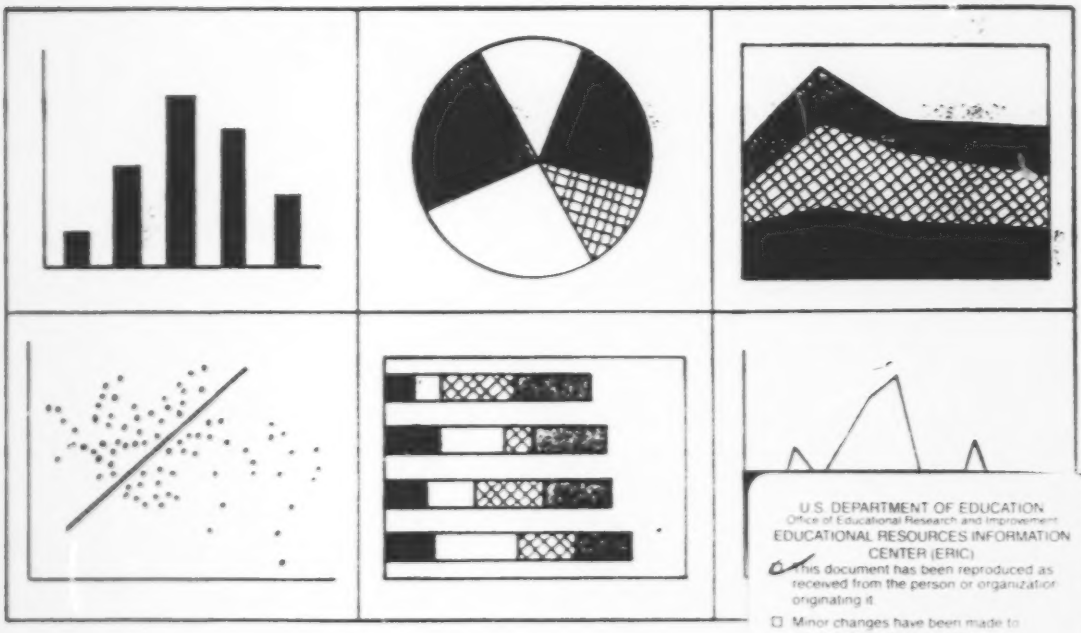

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The Accuracy of Teachers' Self-reports on their Postsecondary Education: Teacher Transcript Study, Schools and Staffing Survey

Working Paper No. 94-04

July 1994

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July 1994

Foreword

Each year a large number of written documents are generated by NCES staff and individuals commissioned by NCES which provide preliminary analyses of survey results and address technical, methodological, and evaluation issues. Even though they are not formally published, these documents reflect a tremendous amount of unique expertise, knowledge, and experience.

The ***Working Paper Series*** was created in order to preserve the valuable information contained in these documents and to promote the sharing of valuable work experience and knowledge. However, these documents were prepared under different formats and did not undergo vigorous NCES publication review and editing prior to their inclusion in the series. Consequently, we encourage users of the series to consult the individual authors for citations.

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The Accuracy of Teachers' Self-reports on their Postsecondary Education

Teacher Transcript Study

Schools and Staffing Survey

Prepared by:

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August 1993

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Introduction

Many elements of our education system are built on the assumption that the characteristics of teachers are important in determining educational effectiveness. Thus, the higher education system includes extensive training in teacher education, and a system of teacher certification is designed to further assure that teachers will have the necessary qualifications. While desirable in concept, however, measuring teacher quality has proved difficult in practice. Teaching styles vary widely, and the wide variation in student needs can make it difficult to specify an ideal set of qualifications even within a single classroom.

One widely assumed component of teacher effectiveness is the extent of teacher preparation in both teacher education and in the specific subject matter being taught. The type of degree earned, the teacher's major and minor, the number and type of courses taken in specific subject areas, and the grades earned all might be considered potential indicators of a teacher's training, and might be used either to guide teacher selection or to modify teacher education requirements.

This study is a methodological study designed to determine the best method for obtaining information on teachers' backgrounds. Specifically, two alternative research methodologies will be compared: the collection of teachers' self-reports of their academic qualifications, as provided on survey questionnaires, and the use of teachers' college transcripts. Transcripts are assumed to ultimately provide the most accurate and complete descriptions of teachers' backgrounds, since they are not subject to potential reporting bias of teachers who may wish to inflate their qualifications, and they provide a degree of detail that might not be possible when dependent on teachers' recall: however, the collection and analysis of transcripts is administratively more complex than the administration of a survey questionnaire.

The 1990-91 Schools and Staffing Survey (SASS) was designed to collect teachers' self-reports of their degrees earned, their majors and minors, the number of courses or credits taken in teacher education and in the teacher's two main teaching areas, and the number of courses taken in science and mathematics (among those teachers who taught at least one course in science or mathematics).[1] Teachers were also asked to list all of the colleges they had attended, so that

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[1]The sample was split in half between teachers who were asked to state the number of courses taken in teacher education and their two main teacher areas, and teachers who were asked to state the number of credits.

transcripts could be collected to verify the accuracy of the data provided by the teachers. The U.S. Bureau of the Census conducted the initial mail and telephone survey of the teachers, and Westat, Inc. conducted the transcript portion of the study.

Data Collection

In order to select the SASS sample for 1990-91, 200 schools were chosen in 10 states; there were 50 public elementary schools, 50 public secondary schools, 50 private elementary schools, and 50 private secondary schools. Of the 200 schools, 174 schools were ultimately determined to be eligible for the study and agreed to participate. A sample of 867 teachers was next selected at the schools, with no more than 5 teachers from any one school. A total of 32 teachers were later determined to be out-of-scope, leaving a total of 835 eligible teachers (Table 1). Based on 637 completed interviews, the final response rate for the teacher questionnaire was 76 percent.

Of the 637 responding teachers, 45 either refused participation in the transcript portion of the study, or failed to supply any information on which colleges they attended. According to the Federal regulations (45 CFR 99.31) that implement the Family Education Rights and Privacy Act (FERPA) (20 U.S.C. 1232g), transcripts may be provided to the U.S. Department of Education or its authorized representatives even *without* the prior consent of the students.[2] For this study, nevertheless, any teachers who specifically refused participation were left out of the transcript study.[3] This left a total of 592 teachers.

Teachers were asked to list all colleges (both undergraduate and graduate) that they attended, whether or not they graduated from those colleges, and transcripts were sought from all colleges listed. Based on the information provided by all teachers, including those who refused

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[2]However, the handling and analysis of the transcripts must be performed in a way that protects the confidentiality of the students.

[3]It is possible that some teachers might have refused participation in the transcript study because they were not proud of their academic qualifications, and they were afraid that the transcripts would show that their self-reports overstated their credentials. In such a case, there is a possible bias from the exclusion of refusals. Data from the SASS teacher questionnaires were used to partially test this hypothesis, but the findings were mixed. There is weak evidence that teachers who refused participation had weaker backgrounds than participating teachers: 30 percent of teachers not in the transcript study said they had master's degrees, compared with 37 percent of those in the study, and 20 percent reported one undergraduate course or less in teacher education, compared with 14 percent of those in the study. (However, neither relationship was statistically significant.) Thus, one could argue that teachers with lower academic qualifications are more reluctant to have their academic records reviewed. However, this does not necessarily mean that the teachers attempted to overstate their credentials. The fact that their self-reports could be used to show a difference in academic qualifications might be interpreted as indicating they were willing to report their backgrounds accurately, without inflating them.

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participation, 1,985 separate transcript requests were identified; of these, 130 were excluded because the teachers refused participation in the transcript study, 14 because the attendance was at a foreign institution, and 6 because the school could not be located based on the information supplied by the teacher, leaving a total 1,835 requests. A total of 1,524 transcripts were received, including 1,356 transcripts among those that were originally requested, and an additional 168 transcripts reflecting an undergraduate or graduate enrollment that had not been indicated on the SASS questionnaires.[4] Additionally, schools sometimes responded in ways other than sending a transcript: in 53 cases, a school indicated that a teacher had never attended, and in 81 cases the school responded that it was unable to locate the teacher's transcript (*e.g.*, because they had insufficient information about the teacher, or because of difficulties in retrieving records that were relatively old). The total number of school responses was 1,658 out of 2,003 identifiable transcript requests (1,835 original requests, plus 169 transcripts received that had not been anticipated), or 83 percent.[5]

Another way of examining the response rate is to determine the amount of data received for each teacher. At least one transcript was received for 92 percent of the teachers. However, while a single transcript was sufficient to provide complete data for some teachers, other teachers had up to 9 separate transcript requests. For those teachers with multiple transcripts, complete data could potentially be obtained in several ways: most typically, all transcripts requested were received, but in some cases the availability of transfer information on one transcript might allow a complete picture of the teacher's academic record, even if the transcript were never received from the institution where the courses were originally taken. Also, in those cases where schools indicated that a teacher had never attended, assuming that the school was correct, it was potentially possible to develop a complete record

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[4]This latter situation occurred when teachers attended the same college both as an undergraduate and as a graduate, but did not indicate both statuses on the SASS questionnaire. In such cases, only a graduate or undergraduate transcript would have been requested (depending on which was indicated by the teacher), but not both. (The distinction between undergraduate and graduate status was made because institutions often treat graduate transcripts as separate transcripts, sometimes even processing those transcripts in a separate office.) It is likely that in some cases, among those institutions that handle graduate and undergraduate transcripts in separate offices, the dual attendance status of the teacher was never identified. However, other institutions did send both graduate and undergraduate transcripts, so that sometimes more transcripts were received than were requested.

[5]Another 94 transcripts were received after the close of data collection, and were not coded. If these transcripts had arrived earlier, the total response rate would have been 87 percent. The calculation of a response rate is complicated because of problems in defining both the denominator (the total number of requests) and the numerator (the number of responses received). In defining the denominator, the rule that was followed was to treat all listings of a college by a teacher as a single transcript request *unless* the teacher took both undergraduate and graduate courses from the same institution, in which case the period of graduate enrollment was treated as a separate transcript request from the undergraduate enrollment. If a new transcript was identified (*e.g.*, because an institution mailed a graduate transcript, even though the teacher had only indicated undergraduate attendance at that institution), that transcript was also treated as a transcript request to be included in the denominator. (Otherwise, it would be possible to have response rates above 100 percent.) In defining the numerator, the complication is that some institutional responses might be considered as legitimate responses even though no transcript was received: for example, if an institution reported that a teacher had never attended, the institution provided all data that were available, and the data were sufficient to make a judgment about the quality of the teacher-supplied data, even without the receipt of a transcript.

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of a teacher's college attendance even without a transcript from that institution.[6] Allowing for these various possibilities, complete data were obtained for 51 percent of the teachers.[7]

The importance of collecting only partial transcript data for some teachers depends on which transcripts were missing, and on the type of information being verified. For example, often a receipt of a degree can be verified even if some transcripts were not received; also, the receipt of a baccalaureate degree might legitimately be assumed if other transcripts indicate the receipt of a more advanced degree. Even when counting the number of courses or credits taken in a subject area, partial transcript data are sometimes sufficient to establish a lower bound that is adequate for verifying the teacher's response on the SASS questionnaire. (For example, a teacher's claim to have taken at least four undergraduate courses in teaching methods might be verified even if only a lower bound is known; similarly, a claim to have taken less than four courses might be rejected if the lower bound is four or higher.) Thus, statistics in this report will often include references to partial data where those data are sufficient for the analysis.

Most teachers (349, or 59 percent) gave their signed permission to collect the transcripts, while the remaining teachers supplied information that could be used to collect transcripts, but did not provide a signed permission form that could be sent to their colleges (Table 2).[8] If teachers did not supply signed permission to collect their transcripts, colleges were sent a letter from the National Center for Education Statistics and a copy of the Federal regulations to indicate that signed permission forms were not required to satisfy Federal privacy requirements. Most colleges were willing to provide transcripts based on this information, but some were not; the net effect was a somewhat lower response rate if no signed permission were available. Among those teachers who gave their signed permission, all transcripts were obtained for 51 percent, while among those for whom no teacher signatures were available, all transcripts were obtained for only 37 percent.[9] Also, for some teachers

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[6] A problem is that since some institutions had difficulty in locating transcripts, the report that a teacher never attended a college sometimes reflected the college's inability to locate the record rather than the teacher's nonattendance. Schools were asked to differentiate between records they could not locate and teachers who never attended, but their responses were not always accurate: sometimes a teacher's attendance could be verified through transfer data at another institution even when the first institution said the teacher had never attended.

[7] In order to provide a complete description of the sample, Table 1 also presents the response rates for public versus private schools, and for the two questionnaire types (courses versus credits); however, there is no theoretical reason to expect different response rate based on these characteristics, and in fact response rates varied only slightly.

[8] In some cases, teachers were administered the questionnaire over the telephone and gave verbal permission to collect transcripts, but no signatures could be provided.

[9] The relationship between the receipt of transcripts and the signed permission of the teachers was statistically significant at the .05 level.

the lack of signed permission was associated with an inability to collect transcripts from *any* of the institutions they had attended: this failure to collect any transcripts appeared for 14 percent of the teachers who failed to provide signatures, but for only 4 percent of those teachers who did provide signatures.

Figure 1 shows the percentage of teachers that gave their signed permission to collect transcripts, based on school characteristics and the type of data provided. The two school characteristics that were examined did not show differences that were statistically significant, with teachers at public schools and elementary schools only marginally more likely to give signed permission (52 percent versus 48 percent for public/private schools, and 60 percent versus 50 percent for elementary/secondary schools). However, both measures that were related to the type of data that teachers provided did show statistically significant results. Teachers who provided data on the number of courses taken were more likely to give permission than teachers who provided data on the number of credits (60 percent versus 47 percent), and teachers who reported having a master's degree were more likely to give permission than teachers who said they had no master's degree (60 percent versus 51 percent). The reasons for these differences cannot be established from the survey questionnaire, but it is possible that teachers who are proud of their academic records (*e.g.*, have advanced degrees) are more likely to give permission, and that teachers who are confident of their responses (*i.e.*, if it is easier to state the number of courses than the number of credits) are more likely to give permission.

Teachers' Self-reports of the Schools they Attended

Teachers were asked to list every college or university they had attended, whether or not they obtained a degree at the college, with space provided for nine colleges. This question was asked in order to facilitate the collection of college transcripts rather than to verify teachers' accuracy in reporting; nevertheless, the teachers' responses can be examined for accuracy. Two different types of errors are possible: teachers may list colleges they never attended, or fail to list colleges that they had attended.

Overall, there were 53 cases (from 44 teachers, or 8 percent of the total number of teachers for whom at least one transcript was collected) in which a teacher contradicted a college, with the teacher reporting attendance but the college stating the teacher never attended. A total of 7 cases could be identified as errors on the part of the college (through transfer notations on other colleges'

transcripts), while the remaining 46 cases (from 38 teachers, or 7 percent) may indicate false reports by the teacher. Additionally, there were 81 cases (from 67 teachers, or 12 percent) in which colleges were unable to locate the teacher's transcripts; for 6 of the cases, attendance at the school could be confirmed through transfer notations on other colleges' transcripts, but this left 75 cases (from 61 teachers, or 11 percent) that might represent false reports. Aside from the data limitations noted earlier, some of these "false reports" may be due to differences in definitions of college attendance. For example, in one case a personal communication from the teacher indicated that the teacher had taken *noncredit* courses at the college; the teacher listed the college on the SASS questionnaire because the teacher felt the courses enhanced her perspective as an educator, while the college does not maintain transcripts for such noncredit courses.

The other type of error -- a failure of the teacher to list all colleges attended -- is more difficult to identify. If a teacher listed no colleges at all, then no colleges were contacted for transcripts, and no data are available to confirm or deny the teachers' academic background. If a teacher gave only a partial list of colleges attended, on the other hand, there is some chance of detecting the error: other colleges' transcripts may include transfer credits from the missing college(s). For 49 teachers (9 percent), transfer information on the transcripts indicated that a total of 53 additional colleges had been attended besides those listed on the questionnaire. These errors might be attributed either to poor memory on a teacher's part, or in some cases, to the relative unimportance of the teacher's attendance at the college (*e.g.*, a teacher may have taken only a single course during the summer, and failed to list the college for that reason).

In short, while the list of colleges attended was not meant as an item for verifying teachers' accuracy, a relatively substantial number of errors were detected. Further, only confirmed errors are reported here, so these estimates provide lower bounds on the number of errors. It may be that if additional colleges were contacted, additional omissions might be detected. One practical implication is that when transcript studies are conducted, the lists provided by teachers or other respondents should not be considered as fully accurate. One possibility is to change the wording of the questionnaire to reinforce that all colleges should be listed (*e.g.*, the questionnaire might specifically mention to include colleges where summer courses were taken), while another is to seek additional sources of information on what colleges were attended (*e.g.*, by inspecting transcripts for notations on additional colleges and then contacting those colleges for transcripts, or by examining administrative records at the schools where the teachers are located).

Teacher Item Response Levels

As noted in the previous section, errors can occur either through teachers providing incorrect responses, or through their failure to provide (complete) responses. At times, these two types of errors might be independent (*e.g.*, a teacher might accidentally skip an item, but be willing and capable of providing a correct answer), while at other times they might be interrelated (*e.g.*, a teacher may skip an item because of an inability to provide the information, or a teacher may respond to an interviewer's persistence for a response by manufacturing a reply or by making a rough estimate). There is no necessary rule as to which type of error is worse: this may depend on the magnitude and degree of bias of the incorrect responses. This section will discuss teacher "errors" associated with non-response, while the remaining sections will examine the accuracy of teacher responses on the SASS questionnaire by comparing them with data from the postsecondary transcripts.

Technically, non-response may occur either through questionnaire non-response, where a teacher fails to respond to an entire survey questionnaire, or non-response to individual items on the questionnaire. However, because the overall response rate to a survey depends so significantly on the methods and extent of followup, it is difficult to compare the overall response rates for the SASS questionnaire and transcript data collection.[10] For this reason, this section will focus on item non-response, and especially on comparisons of non-response rates among different items to distinguish which types of data are most difficult to collect. Even with this limitation, caution should be applied because of the great variability of non-response from one survey to another. For both overall non-response and item non-response, the level of non-response will depend on the actual design of the questionnaire, the mode of administering the questionnaire (*e.g.*, by mail or by telephone), the degree and methods of followup for non-response, the level of burden presented by the questionnaire, the resources available for survey administration, and other aspects such as the degree to which the questionnaire includes questions on sensitive topics, and the degree to which the potential respondent perceives the survey to be useful.

Table 3 shows that item response rates varied depending on the level of detail requested. The item response rates were highest for general information about degrees earned (*i.e.*, 97 percent or

[10]However, it should be noted that 24 percent of the eligible teachers failed to respond to the survey, and that obtaining high response rates appears to getting more difficult for all surveys. There may be situations where, even without the help of teachers' signed permission to collect transcripts, and depending on the potential burden and intrusiveness of the questionnaire, the collection of transcripts may provide the best opportunity for high survey response rates.

higher). For the other questionnaire items, teachers generally were more likely to respond about *whether* they took courses in a subject area than about the *number* of courses they took. For example, 86 percent responded on whether they took biology or life science courses, and 77 percent to 79 percent on the number of courses in that field. Teachers also were more likely to provide information on whether a semester or quarter system was used than to provide more detailed responses on the number of courses or credits. Teachers appeared to have an easier time providing data on the number of graduate courses taken than on the number of credits earned (85 percent versus 78 percent for courses in teaching methods, 79 percent versus 71 percent for courses in the main teaching assignment, and 42 percent versus 38 percent in the second teaching assignment), although essentially no difference appeared in describing courses at the undergraduate level. There were mixed results on whether teachers were more likely to provide course data at the graduate or undergraduate level: there was little difference for the questions devoted to courses in mathematics and science, but higher response rates at the undergraduate level for courses in teaching methods and in the main teaching assignment.[11]

There is no direct measure of the reason why higher response rates were received for some items than for others. However, as noted, the general pattern was that teachers were less likely to answer questions that were highly specific. This may explain why teachers were sometimes more likely to report on the number of courses taken than on the number of credits earned. It is more difficult to explain the occasional differences between reporting on the undergraduate level versus the graduate level; perhaps the general explanation is that the undergraduate level was more salient because of the way that graduation requirements are defined (in terms of the number of courses required for a major) and because undergraduate courses are more likely to be taken over a compact time period, but that responses still could be easier for the graduate level if teachers were highly likely to have taken *no* courses in a subject area (*i.e.*, for mathematics and science, and possibly for graduate courses in the second teaching assignment).

Teacher's Self-reports on the Degrees they Earned

Teachers were asked if they had obtained five different types of degrees: bachelor's degrees, master's degrees, associate degrees, education specialist or professional diploma (at least one

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[11]Typically, for each of these types of comparisons, the majority of comparisons were statistically significant. However, the exception was in comparing responses on the number of courses to the number of credits: the results were significant only at the graduate level, and only for courses in teaching methods or education.

year beyond the master's level), and a doctoral or first professional degree. For those degrees they had earned, they were asked to state the major(s) and the year the degree was received. In the analysis that follows, only four degrees will be discussed; the category *education specialist or professional diploma* applied to only 15 teachers, and no clear indication could be found on the transcripts that corresponded to such a degree. (Typically these teachers had a master's degree in education or graduate training in education, but there was no clear distinction between these teachers and other teachers. Master's degrees in education were incorporated within the general category of all master's degrees.) Additionally, while tables will present statistics on doctoral or first professional degrees, the small number of such degrees precludes detailed analysis.

Report on type of degrees earned

Generally, the teachers' self-reports on what degrees they earned showed a high correspondence with the information on the transcripts, though up to 13 percent of the cases showed discrepancies for any particular degree (Table 4).

Teachers' self-reports were most accurate on their bachelor's degrees, where there were almost no cases of incorrect data that could be identified. Essentially all teachers (528 of 538) reported they earned a bachelor's degree, and for all but 22 respondents, that report could be confirmed. Additionally, for all seven teachers who indicated they did not receive a bachelor's degree, the transcripts matched their self-reports.[12] For 80 percent of the respondents, the reports were confirmed directly through the indication of a bachelor's degree on a college transcript. For another 14 percent, some problem prevented a direct confirmation of the degree (*e.g.*, a teacher failed to list all colleges attended, or not all transcripts were received), but the presence of a bachelor's degree could be inferred based on a transcript showing a higher degree (4 percent) or a transcript showing graduate level work (10 percent). Finally, among those 22 whose degree could not be confirmed, only partial data were received for 19 cases, so it is possible that the lack of confirmation of the bachelor's degree was due only to the failure to receive a requested transcript. The remaining three teachers whose degrees were not confirmed might have either failed to correctly indicate all colleges they attended, or

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[12]Technically, it is possible that a teacher failed to list all colleges that he/she attended, and if a complete set of transcripts were available, a bachelor's degree might have been located. Thus, it is almost impossible to state definitively that a teacher had not earned a bachelor's degree. What can be said is that the transcripts that were collected were consistent with the teachers' self-reports. In addition to these seven teachers who said they received no bachelor's degree, there were three teachers who did not state whether they received a bachelor's degree. For these three teachers, there is no self-report to confirm or deny; however, the failure to provide data is itself a problem with self-reporting, as discussed in the previous section.

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answered incorrectly on what degrees they earned. These three teachers, plus the three who failed to respond to the SASS question on bachelor's degrees, are the only teachers who can be clearly identified as providing incorrect or incomplete data on their bachelor's degrees.

A greater number of errors could be found in teachers' reports on master's degrees. A total of 9 teachers (2 percent) failed to indicate they received a master's degree, despite such an indication on their transcripts.[13] Also, an additional 57 teachers (11 percent) could not have their degrees confirmed: these included 8 confirmed discrepancies (1 percent) -- teachers for whom all transcripts were received -- and 49 possible discrepancies (9 percent) that may be caused by partial transcript data. Thus, the total proportion of teacher errors falls somewhere within the range of 3 to 12 percent.

Teachers displayed the same two types of errors in reporting on associate degrees as on master's degrees: 22 teachers (4 percent) failed to report an earned associate degree, and 16 teachers (3 percent) failed to have a self-reported degree confirmed. For 11 of the 16 teachers in the second group, only a partial set of transcripts was available.

Five teachers reported receiving doctoral degrees; of those, four degrees were confirmed, while only partial transcript data were available on the fifth. No other potential errors were detected concerning doctoral degrees.

Report on the year the degree was earned

Besides ordinary problems with recall, there can be legitimate reasons for errors in reporting the year that a degree was earned. Sometimes the official award of a degree is delayed until the next scheduled graduation ceremony, even though all requirements for a degree may have been met the previous year. Also, sometimes a degree is awarded conditionally so that a student may participate in a graduation ceremony with his/her peers, even though some requirements must be met before the degree is actually awarded.

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[13] Because the transcript data collection occurred a year after the administration of the SASS questionnaire, it is possible for the transcripts to provide more up-to-date information, including additional degrees earned. To prevent this possibility from producing misleading results, only teachers who earned their degrees by 1990 were included in the 9 who failed to report an earned master's degree.

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Teachers' reports on the year their degree was earned was more subject to error than their reports on the degrees themselves, with the proportion of errors ranging from 12 to 32 percent of those cases where direct comparisons could be made (Table 5). Most typically, among those teachers with identified errors, teachers' reports were off by 1 year.

Among those 427 teachers for whom the year of receiving a bachelor's degree was available, 88 percent reported the same graduation year as in the transcript, while 12 percent made a reporting error. The discrepancies were relatively evenly split between teachers who made an error of 1 year and those who off by more than 1 year, and between teachers who stated a year that was too recent and teachers who stated a year that was too early.

A greater proportion of errors occurred for master's and associate degrees (28 and 32 percent, respectively), though most were off by only 1 year. Again, the errors were roughly evenly split between those who reported years that were too recent and those that reported years that were too early. There is no obvious reason why the error rate would be higher for master's and associate degrees than for bachelor's degrees. One hypothesis is that associate degrees are not as salient for the teachers because the teachers later received higher degrees; however, by this logic, master's degrees should be more salient -- and thus better remembered -- than bachelor's degrees, resulting in a lower error rate. There may be other characteristics of bachelor's degrees that make them more salient in terms of the year the degree was earned. For example, for purposes such as alumni events, bachelor's degree recipients are often identified in terms of the graduating class, while master's degree recipients may be less often identified in that way; also, for "traditional" students a bachelor's degree occurs at the end of four contiguous years of full-time college attendance, making that time period stand out from other time periods, while graduate degrees are often earned on a part-time basis while working, so that the period of attendance may not stand out as well. Figure 2 provides partial confirmation of this last hypothesis, although the distribution was not statistically significant: a higher rate of conflicts appeared between teachers self-reports if the master's degree was earned 6 to 10 years after the bachelor's degree (*i.e.*, in a time period that is likely to include a mixture of employment and other events that may make the timing of the degree stand out less) than if the master's degree was earned in a shorter time interval (38 percent versus 23 percent); however, the rate of conflicts was lower (25 percent) if the master's degree was earned more than 10 years after the bachelor's degree, possibly because the degree was then relatively recent and thus easier to remember.

Report on majors and minors

Teachers were asked to asked to write the major field of study for each degree they had earned, and to provide a two-digit code for that major based on a table provided in the questionnaire. For bachelor's degrees, they were also asked to write their second major or minor if they had one.

Verifying the accuracy of teachers' self-reports on their majors is different from verifying the degree information discussed in earlier sections because the accuracy of teachers' coding decisions is also involved. When compiling information from transcripts, it is possible to provide training sessions and manuals to prepare coders for the coding decisions, and coders' accuracy and consistency can be regularly monitored. No such training or monitoring is provided to the teachers, however, so one might expect substantial inconsistencies among teachers. For example, a teacher might not notice that separate codes are provided for mathematics (33) and mathematics education (34), and thus might easily provide an incorrect code. Also, teachers might be influenced in their coding decisions by subjective factors (such as their reasons for enrolling in a particular major), so they might describe their majors differently from the way they were officially recorded. Thus, a teacher who majored in mathematics in order to become a high school mathematics teacher might think of his/her major as being in mathematics education, rather than in mathematics.[14]

For 65 percent of those teachers earning bachelor's degrees whose self-reports could be compared with the transcript record of their majors, the subject matter was correctly coded (Table 6). Additionally, another 10 percent showed discrepancies only in whether the subject area was listed as a separate discipline or as an area within education. Most typically for this group of teachers, the teacher listed an area of education (*e.g.*, music education) while the transcript showed only the subject area alone (*e.g.*, music). A somewhat greater discrepancy occurred when teachers and transcripts both reported majors within education, but within different specialties (12 percent). Most of these discrepancies might easily be classified as coding errors or differences in interpretation (*e.g.*, a teacher who prepared for teaching high school mathematics might list the major as either secondary education or mathematics education), while very few involved radically different fields. (One of the greatest discrepancies was a teacher who reported a major in general special education, while the transcript showed a major in agricultural education.)

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[14]Of course, it is also possible that a teacher may correctly indicate his/her major, while an error occurs in coding the transcript. Aside from coder errors, this can occur when transcripts are not clearly marked (*e.g.*, because of the use of abbreviations). However, because the coding of transcripts was carefully monitored, and because no training was provided to teachers, it is more likely that discrepancies are due to teacher errors.

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The remaining 13 percent of the teachers showed the greatest discrepancies. In a few cases, the discrepancies were quite large (*e.g.*, a teacher who reported a major in biology/life science, while the transcript showed a major in art), but often these discrepancies were also a matter of judgment (*e.g.*, one teacher reported an education major in counseling and guidance, while the transcript showed a major in psychology). Sometimes also the discrepancies reflected differences in the definitions of coding categories; for example, geography is commonly classified as a social science, but one teacher chose the code for geology/earth science.

Teachers' Reports on the Courses they Took

Teachers were asked in SASS about the courses they had taken in teacher education, the teacher's main teaching assignment, and the teacher's second teaching assignment. A sample of roughly one half of the teachers were asked the number of undergraduate and graduate courses they had taken in each field, while the other half were asked the number of credits. For the main and second teaching assignments, teachers were asked to provide their answers in categories that were designed to correspond to common requirements for majors and minors (*i.e.*, 0 courses, 1-4 courses, 5-9 courses, and 10 or more courses, or for those providing answers in numbers of credits, 0 credits, 1-10 credits, 11-20 credits, 21-30 credits, and 31 or more credits.)[15] For teacher education courses, the categories were different: 0 courses, 1 course, 2-3 courses, or 4 or more courses; or 0 credits, 1-3 credits, 4-9 credits, and 10 or more credits. Teachers were also asked whether the courses were taken using a semester system, a quarter system, or both.

The coding procedure used in verifying teachers' reports was to first identify what fields the teacher had reported in the SASS questionnaire, and then examine the teachers' transcripts to locate all courses fitting within those fields. If there were ambiguity in whether a course should be classified within the designated area (*e.g.*, because it might legitimately be classified within two separate disciplines), teachers were assumed to have counted such courses as part of their academic background, and thus the courses were coded within the specified field. This coding procedure was chosen as the method of best approximating how teachers might answer the SASS questionnaire, but may sometimes result in overestimates of the number of courses taken. In some cases, also, the coding of a course might depend on the specific set of fields declared by the teacher. For example, if a teacher declared

[15]The number of credits was not designed to correspond exactly to the number of courses.

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reading education as one of the two main teaching areas, reading education courses were counted separately from other teacher education courses in order to verify the teacher's report; otherwise, reading education courses were classified within teacher education, because it was assumed that teachers would classify the courses in the same way. Similarly, all science courses would be classified within general science if that was the only science area specified by the teacher; on the other hand, a teacher who declared areas within both physics and general science would have had all physics courses treated separately, while general science would be assumed to cover all science courses other than physics.

Courses and credits in teacher education

Because a great number of teachers had majored in teacher education (especially among teachers at the elementary grade level), and because the SASS questionnaire defined teacher education as including education courses that were designed for specific program areas (*e.g.*, mathematics education), the great majority of teachers took 4 or more courses (or 10 or more credits) in education. Since this was the highest category available on the SASS questionnaire, one would expect relatively high accuracy in teachers' self-reports: they were likely to be able to choose the category *4 or more courses* without having to count the exact number of courses, and if they had taken fewer courses, only a small number of courses needed to be remembered and counted.

Overall, two-thirds (68 percent) of the teachers gave responses that matched their transcripts at the undergraduate level (Table 7).[16] The highest rate of accuracy was in the category *4 or more courses*, with 81 percent giving responses that could be directly confirmed, and only 3 percent giving responses that were contradicted by the transcripts. The remaining 16 percent could not have their responses confirmed or contradicted, because while the transcripts showed fewer courses than reported by the teachers, the failure to collect all transcripts may have resulted in missing some courses. The next highest accuracy level was among those teachers reporting they had taken no courses in teacher education; teachers may have an easier time remembering whether they have taken any courses than in counting the exact number of courses. Among the other two categories (*i.e.*, from one to three courses reported by the teacher), a majority of the teachers understated the number of teacher education courses they had taken. Some possible reasons for this high rate of errors are: the

[16]For 24 percent of the teachers, it is possible that some teachers took more courses than were identified from the transcripts, because at least one transcript was never received. However, their reports are consistent with the data that are available. Also, two-thirds of these teachers fell within the category of those who reported taking 4 or more courses in teacher education; in their case, it is not possible for an additional transcript to conflict with their response, because there is no upper limit for this category.

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questionnaire required an unusually high level of precision in these categories, with the failure to remember a single course having the potential to make a teacher's response incorrect; teachers may have difficulty remembering those areas where they took only a small number of courses; and teachers may have failed to follow the instruction to include courses such as mathematics education within the teacher education category.

Roughly the same patterns of accurate versus inaccurate responses were found in teachers' reports of the number of credit hours taken, and in their reports on graduate courses in education. However, one difference is that teachers were less likely to underestimate the number of graduate teacher credit hours taken, and more likely to overestimate the amount.

Courses and credits in teachers' main teaching assignment

As noted earlier, somewhat broader categories were used for collecting data on teachers' main teaching assignment, corresponding roughly to requirements for majors and minors. Fewer teachers responded to this question because teachers whose main teaching assignment was prekindergarten, kindergarten, general elementary, or special education were directed to skip to the next question.

The overall rate of accuracy was lower than for teaching education, with 53 percent giving responses that could be directly confirmed at the undergraduate course level (Table 8).[17] Also, the percentage of teachers who overestimated the number of courses was much higher than for teacher education (35 percent), and even though half of these potential errors (18 percent) may be due to incomplete transcript data, the remainder is much higher than that found in teacher education. This difference may be due to the difference in the categories being used, since a much greater number of courses was required to qualify for the highest category. There also was a difference in the tendency to underestimate the number of courses taken. Excluding the highest category (by definition, a teacher who reported 10 or more courses could not have given an underestimate), teachers were less likely to give underestimates of the number of courses (from 30 to 50 percent) than in teacher education (from 44 to 63 percent). This may be due to the larger categories being used, although another explanation is that teachers can better remember courses in their main teaching area.

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[17] All of the comparisons in this paragraph are statistically significant.

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Again, the results for teachers' self-reports on credit hours were not substantially different from those on the number of undergraduate courses taken. However, teachers were somewhat less accurate in their counts of graduate courses, with more overestimates and fewer underestimates.

Courses and credits in teachers' second teaching assignment

Few teachers reported a second teaching assignment, so these estimates have higher sampling error.

A higher level of teacher error was found for the second teaching assignment at the undergraduate course level than for the main assignment, with only 37 percent of the responses being directly confirmed (Table 9).[18] The largest group of errors was among teachers overestimating the number of courses taken; even excluding those teachers whose transcript data were incomplete, 26 percent (combining the categories of *all transcripts received* and *all received including transfers*) of the teachers overestimated the number of courses. An even higher error rate was found among those reporting the number of undergraduate *credits* earned, with only 14 percent being directly confirmed, and 45 percent confirmed as overestimating the number of courses.

Reports on semester and quarter systems

Whether counting the number of courses taken or credits earned, the answer can only be properly interpreted by knowing whether the courses were taken using the semester system or the quarter system. Typically, a standard course will be allocated three credit hours in either a semester system or a quarter system, but a greater total number of courses and credits must be taken for graduation within the quarter system. Thus, courses or credits must be deflated within the quarter system to provide a standardized measure for comparing one teacher with other.

However, teachers' ability to report accurately on which system was used depends on several issues. One possible hypothesis is that teachers have an easier time describing the term type than in describing their courses, because the term type is typically consistent for their entire enrollment at a college, while describing their courses requires considerably more detailed knowledge. On the

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[18] Because of the small number of cases, the comparisons in this paragraph are not statistically significant.

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other hand, people typically are better at remembering events that are highly salient, and the types of courses taken (especially in what may often be a student's major) are more salient than the term type. Further, the questionnaire may sometimes require complex judgments: if a teacher took one or two summer courses at another school for transfer credit, he/she may have to remember both what type of terms were used at the transfer school, and whether the courses taken at the school were in teacher education or in the main or second teaching assignment areas. It is common for a teacher to have attended many schools at both the undergraduate and graduate levels, so a teacher may have difficulty in sorting out the courses by area at each school.

Table 10 shows that teachers who reported that all courses were within the semester system were almost always correct (93 percent within teacher education), but that teachers who reported all courses were within the quarter system were about equally likely to be either correct (53 percent) or incorrect (47 percent). (Note that in the case where only some transcripts have been received, the fact that even one transcript conflicts with a teacher's self-report is sufficient to label that teacher's response as incorrect, because the teacher was reporting that *all* courses within the subject area were within the quarter system. On the other hand, it is possible that some of the teachers whose self-reports matched the transcripts in these categories might be found to be incorrect if more transcripts were received.) Teachers who reported they had taken courses within both semester systems and quarter systems showed the lowest rate of confirmation (44 percent); however, 32 percent of the teachers in this category had only partial data available, and in this case the availability of all transcripts might have confirmed that the teachers were correct. (For the *Semester* and *Quarter* responses, a single transcript could be sufficient to prove that a teacher was not accurately describing *all* courses, while multiple transcripts were generally required to confirm that a teacher was correct in reporting that both semester and quarter systems were used.)

The differing patterns of response appear to be due largely to the great predominance of semester systems over quarter systems (64 percent of all teachers' self-reports within teacher education, and 75 percent of all courses for which data were collected in this study). Many teachers attended only colleges using the semester system, which might both make semester systems prominent in their memories and would limit the damage from accidentally excluding a school (*e.g.*, if a teacher only describes the system he/she used as an undergraduate, no error would be introduced by that partial report). On the other hand, because most teachers attended multiple colleges (*e.g.*, through transfers, or through pursuing both undergraduate and graduate education), it is likely that a teacher attended at least one college using the semester system; thus, the response that the teacher took courses

only using the quarter system should be quite rare (as, in fact, it was in the survey). The high level of error in teachers' self-reports might be explained by teachers failing to consider all schools that were attended, and only considering the school where they took the most courses in that subject area.

Reports on mathematics and science courses

For those teachers who taught at least one course in science or mathematics (whether or not it was one of their main teaching assignments), teachers were asked to state the total number of courses taken in the following disciplines: mathematics, computer science, biology or life science, chemistry, physics, earth or space science, and other natural science. Unlike the questions discussed earlier, where the number of courses was grouped into categories, teachers were asked to state the exact number of courses taken within each discipline.

Depending on the discipline, the proportion of teachers who were able to correctly state the exact number ranged from 30 percent (in mathematics) to 71 percent (in physics; Table 11).[19] However, in many cases, teachers were able to correctly state the exact number because they had taken no courses at all within the discipline (*e.g.*, as noted earlier, it is probably easier to remember taking no courses than to remember the exact number). If these zeroes are excluded, the proportion giving correct answers was much lower, and ranged from 8 percent (in other natural science) to 44 percent (in chemistry). Excluding the zeroes also had the effect of reducing the variation between disciplines (especially between mathematics and other disciplines).[20]

The general tendency was for teachers to overstate the number of courses they had taken in a discipline. The difference was largest in mathematics, with teachers' self-reports showing an average of 6.5 undergraduate courses, while the transcripts showed an average of 5.7. However, this understates the degree of error in the teachers' self-reports. Because some teachers gave overestimates and others gave underestimates, the errors partially balance out when calculating overall means. If only the size (and not the direction) of the difference between the teachers' self-reports and the

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[19]Because of the emphasis on exact responses in this section, only teachers for whom all transcripts were available (or for whom full records were available if transfer courses were included) were included in the analysis.

[20]Generally, this analysis will include those teachers who reported taking no courses in a discipline, because these teachers can also be tested for errors in reporting. In fact, a total of 25 teachers stated that they had taken no courses within one of the listed disciplines, but a transcript showed they had taken such a course. Such an error may be due to either the teacher's forgetting about a particular course, or the teacher classifying the course in a different manner than in the transcript analysis. Still, these errors (of reporting that no courses were taken) were less common than errors in reporting the exact non-zero number of courses taken.

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transcripts is considered, the difference tends to be much larger: for example, for undergraduate courses in mathematics, the average difference is then 2.1 (rather than 0.8).

Teachers' reports on the graduate courses they had taken showed a similar pattern to their reports on undergraduate courses. However, they often were able to state the exact number of courses they had taken, due to the fact that graduate education is typically more specialized and they had taken no courses in the discipline. If the zeroes are excluded, teachers were actually less accurate in reporting on graduate courses than in reporting on undergraduate courses. (For example, 12 percent or less gave reports that matched exactly with their transcripts for mathematics, computer science, biology or life science, and physics, compared with 25 percent or more at the undergraduate level.) Also, perhaps because teachers tended to take fewer graduate courses in the mathematics and science disciplines, the total distance between their self-report and their transcripts was sometimes smaller (*i.e.*, especially for mathematics -- 0.8 versus 2.1, computer science -- 0.3 versus 1.0, and biology -- 0.4 versus 1.3).

The Accuracy of Teachers' Self-reports and Teacher Characteristics

In order to determine whether some types of teachers were more likely to give accurate responses than other types of teachers, accuracy rates were calculated for several key statistics. Cases where teachers' accuracy could not be clearly determined because of incomplete transcript data were excluded.

No teacher characteristic showed a consistent pattern with relation to teacher accuracy for every statistic (Table 12).[21] For example, while some of the strongest differences were related to teachers' gender (80 percent of female teachers gave accurate responses on the number of teacher education courses, compared with only 64 percent among male teachers), for three of the eight statistics male teachers showed a higher accuracy rate. One might expect that teachers who received their bachelor's degree relatively recently could provide more accurate answers than those who had to recall their course backgrounds over longer periods of time, but again no consistent trend was found. Finally, the results were mixed based on the institutional control (public/private) of the schools where teachers taught.

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[21] With only three exceptions, the relationships were also statistically insignificant. Given the lack of a consistent pattern, and risk of finding statistical significance when multiple comparisons are made, no teacher characteristic can be clearly related to teacher accuracy.

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Summary

Several different types of teacher errors were detected when examining the SASS questionnaires and comparing them with the transcripts:

- Item non-response sometimes was a significant issue, particularly with respect to teachers' ability or willingness to provide detailed course data.

- Some of the errors detected in this study may be classified as errors of omission. Respondents often failed to list all colleges they had attended, as identified through an examination of their transfer courses. Errors in identifying term types also might most likely be errors of omission, in which respondents only described the term type for one or two colleges attended, and failed to allow for courses taken at other colleges.

- Other errors appeared to show bias on the part of the respondent. For example, though there were errors in both directions, the general pattern was for teachers to overstate their preparation in their second teaching assignment and in mathematics and science as compared with the records on their transcripts. Since courses were coded as falling within the specified areas if there were any ambiguity, this overstatement is the reverse of what might be expected if there were simply differences between the teachers and coders in how to classify courses.

- Some studies have found a tendency for survey respondents to "telescope" events, reporting that an event occurred more recently than was actually the case. However, telescoping was not a major factor in this study. Errors in reporting the year a degree was earned were roughly evenly split between reports that were too recent and those that were too early; further, to the extent that there was a difference, teachers were more likely to state a year that was too early.

- Finally, it should be noted that "errors" can also reflect differences in judgment. In a transcript analysis, it is possible to take many actions to help assure uniformity in how teachers' records are compared: for example, this study included special advance training of the transcript coders, the provision of a dictionary of courses with appropriate codes, close monitoring by supervisors of the transcript coding, and computer checks of the analysis file for consistency across all transcripts. Survey respondents, on the other hand, are not provided with comparable training or resources, and it should not be surprising that different respondents will answer a questionnaire differently, or that their judgments will sometimes disagree with those of a trained coder.

Still, no data collection method is perfect for every occasion. Though transcripts were used here as the source for evaluating the accuracy of teachers' self-reports, transcripts themselves also present problems. One difficulty is the work required for the processing of transcripts: transcripts may be illegible or use abbreviations or notations whose meanings are not immediately apparent, and college catalogs are sometimes necessary in order to properly interpret the transcript (especially for

identifying and coding courses). Another problem is that transcripts also can contain errors or inconsistencies. Aside from the minor possibility of transcription errors or other idiosyncratic sources of error, transcripts may be inconsistent from one institution to another (or from one time period to another) because transcripts are designed to measure a student's progress *as defined by the institution*, and not according to a national standard. For example, transcripts vary in the way that failures, withdrawals, remedial/not-for-credit courses, and incompletes are treated, with some transcripts providing complete information, and others providing limited or no information. These issues might not be "errors" in the sense that institutions fail to follow their own standards, but they may result in missing or inconsistent data with the same effect on data quality as respondent errors. However, even with such inconsistencies, one advantage of transcripts over self-reports is that rules should be available from the institution (*e.g.*, in the catalog or on the transcript) for determining which courses/grades will be listed on the transcript, so it is possible to know the data limitations and to attempt to compensate for them (or create flags to identify them); with teachers' self-reports, in contrast, it is more difficult to know which teachers consistently followed the instructions and which did not.

In short, teachers' self-reported data and transcript data each have advantages and disadvantages. The determination of which kind of data to collect will depend on the quality of data desired, the type of data to be collected, the resources available, and considerations such as the amount of burden to be placed on a survey respondent.

For some types of data, such as general information on what degrees were earned, teachers showed high response rates and gave highly accurate data. There is little need to collect transcripts to verify these types of data, and the administration of a questionnaire is likely to be both simpler and less expensive.

For more detailed data, the questionnaires were less useful. Non-response presented greater difficulties (often with about 25 percent non-response), and teachers who gave responses were less likely to be accurate. For areas that were not highly salient (such as the second teaching assignment), the levels of non-response were sufficiently high that the administration of survey questionnaires seems inappropriate. For areas that might be complicated (*e.g.*, the differentiation between terms using the semester system and those using the quarter system), teachers' responses were also less reliable: given the predominance of semester systems, it would be roughly as accurate to assume all courses were semester courses as to use the teachers' responses. In general, it appears

better to request information on the number of courses than on the number of credits, given both the lesser likelihood of getting signed permission when questions on the number of credits were used, and the lower item response rates and accuracy rates. However, the usefulness of teachers' self-reports on courses depends on the level of detail requested. Teachers were most accurate when relatively large categories were used (*e.g.*, four courses or more in teacher education) or when identifying that they had not taken any courses in a field; they were not as effective in counting the exact number of courses. Teachers were also more accurate in describing their backgrounds in teacher education and their primary teaching assignment then in describing their backgrounds in their second teaching assignment; thus, courses may quickly drop in salience once teachers are asked about courses outside of their majors.

Table 1. Response rates by institutional control and questionnaire type

Response status	Total		Control				Questionnaire type			
			Public		Private		Courses		Credits	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
SASS Teacher Questionnaire										
Total sample	867	100	430	100	437	100	433	100	434	100
Out-of-scope	32	4	14	3	18	4	10	2	22	5
Adjusted sample	835	100	416	100	419	100	423	100	412	100
Responded to survey	637	76	337	81	300	72	343	81	294	71
In transcript study*	592	71	312	75	280	67	322	76	270	66
Transcript Data Collection										
Total original transcripts identified	1,985	100	1,136	100	849	100	1,039	100	946	100
Valid cases	1,835	92	1,000	88	835	98	1,027	99	808	85
Teacher refusal	130	7	130	11	0	0	0	0	130	14
School ineligible/not locatable	20	1	6	1	14	2	12	1	8	1
Adjusted number of transcripts	2,003	100	1,117	100	886	100	1,110	100	893	100
Original requests	1,835	92	1,000	90	835	94	1,027	93	808	90
New discoveries	168	8	117	10	51	6	83	7	85	10
Total institution responses	1,752	87	988	88	764	86	987	89	765	86
Original transcripts received	1,356	68	745	67	611	69	769	69	587	66
New transcripts received	168	8	117	10	51	6	83	7	85	10
Teacher never attended	53	3	20	2	33	4	31	3	22	2
Transcript not located	81	4	44	4	37	4	49	4	32	4
After data collection ended	94	5	62	6	32	4	55	5	39	4
Responses per teacher										
Total teachers	592	100	312	100	280	100	322	100	270	100
Total with complete data	302	51	157	50	145	52	165	51	137	51
All transcripts received	267	45	142	46	125	45	141	44	126	47
Complete with transfer data	18	3	10	3	8	3	13	4	5	2
Complete except for reports that the teacher never attended	17	3	5	2	12	4	11	3	6	2
Partial data received	243	41	133	43	110	39	134	42	109	40
No transcripts received	47	8	22	7	25	9	23	7	24	9

*To be in the transcript study, teachers must have accepted participation and listed colleges that could be contacted.

NOTE: Percentages may not sum to totals because of rounding.

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Table 2. Response rates by teacher's provision of signed permission to collect transcripts

Response status	Signature provided		No signature provided	
	Number	Percent	Number	Percent
Total teachers	349	100	243	100
Total with complete data	194	56	108	44
All transcripts received	177	51	90	37
Complete with transfer data	9	2	9	4
Complete except for reports that the teacher never attended	8	3	9	4
Partial data received	141	40	102	42
No transcripts received	14	4	33	14

NOTE: Percentages may not sum to totals because of rounding.

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Table 3.--Percentage of cases with complete data in teacher survey

Type of information collected	Number of teachers eligible	Response rate
Bachelor's degree		
Receipt of degree	637	100
Year of degree	624	98
Major	624	100
Master's degree		
Receipt of degree	624	99
Year of degree	232	97
Major	232	97
Courses in mathematics and science		
Mathematics		
Took courses	189	90
Number of undergraduate courses	179	86
Number of graduate courses	179	88
Computer science		
Took courses	189	88
Number of undergraduate courses	120	73
Number of graduate courses	120	80
Biology or life sciences		
Took courses	189	86
Number of undergraduate courses	150	77
Number of graduate courses	150	79
Chemistry		
Took courses	189	83
Number of undergraduate courses	132	74
Number of graduate courses	132	74
Physics		
Took courses	189	83
Number of undergraduate courses	120	73
Number of graduate courses	120	73
Earth or space science		
Took courses	189	83
Number of undergraduate courses	103	64
Number of graduate courses	103	66
Other natural science		
Took courses	189	78
Number of undergraduate courses	93	52
Number of graduate courses	93	53
Courses in teaching methods or education		
Took courses	637	98
Number of undergraduate courses	323	92
Number of undergraduate credits	271	90
Number of graduate courses	323	85
Number of graduate credits	271	78
Semester or quarter system	594	97
Courses in main teaching assignment		
Took courses	317	94
Number of undergraduate courses	168	92
Number of undergraduate credits	136	89
Number of graduate courses	168	79
Number of graduate credits	136	71
Semester or quarter system	304	91
Courses in second teaching assignment		
Took courses	160	59
Number of undergraduate courses	78	54
Number of undergraduate credits	76	53
Number of graduate courses	78	42
Number of graduate credits	76	38
Semester or quarter system	154	56

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Table 4.--Accuracy of teachers' self-reports on the academic degrees they earned

Comparison of self-reports and transcript data	Bachelor's degree		Master's degree		Associate degree		Doctoral degree	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total	538	100	538	100	538	100	538	100
Degree confirmed	430	80	138	26	20	4	4	1
Higher degree confirmed	21	4	1	0	--		--	--
Graduate work performed	55	10	--		--		--	--
Unreported degree found	0	0	9	2	22	4	0	0
No degree (confirmed)	7	1	329	61	471	88	524	97
Degree not confirmed	22	4	57	11	16	3	1	0
All transcripts received	3	1	8	1	5	1	0	0
Some transcripts received	19	4	49	9	11	2	1	0
Missing data (SASS)	3	1	4	1	9	2	9	2

NOTE: Percentages may not sum to totals because of rounding. Of the 592 total teachers in the study, 47 were excluded because no transcripts were collected, and 7 because they were administrators or other personnel who were not asked to complete the relevant section of the questionnaire.

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Table 5.--Accuracy of teachers' self-reports on the year they earned their academic degrees

Comparison of self-reports and transcript data	Bachelor's degree		Master's degree		Associate degree		Doctoral degree	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total	427	100	137	100	19	100	4	100
Transcript matches self-report	374	88	99	72	13	68	4	100
Transcript conflicts with self-report	53	12	39	28	6	32	0	0
Direction of discrepancy								
Self-report too recent	22	5	19	14	2	11	0	0
Self-report too early	31	7	20	15	4	21	0	0
Size of discrepancy								
1 year	28	7	27	20	5	26	0	0
More than 1 year	25	6	12	9	1	5	0	0

NOTE: Percentages may not sum to totals because of rounding. Cases with missing data on the year the degree was earned are excluded.

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Table 6.--Accuracy of teachers' self-reports on their majors

Comparison of self-reports and transcript data	Bachelor's degree				Master's degree		Associate degree		Doctoral degree	
	First major		Second major or minor							
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total	424	100	425	100	136	100	10	100	4	100
Transcript matches self-report	276	65	83	20	76	56	6	60	2	50
Transcript and self-report in same subject area, but differ on education emphasis	43	10	29	7	4	3	1	10	0	0
Transcript and self-report both in education, but in different fields	52	12	63	15	31	23	1	10	0	0
No second major or minor	--	--	107	25	--	--	--	--	--	--
Only transcript shows second major or minor	--	--	18	4	--	--	--	--	--	--
Only self-report shows second major or minor	--	--	98	23	--	--	--	--	--	--
Transcript conflicts with self-report	53	13	27	6	25	18	2	20	2	50

-- Not applicable.

NOTE: Percentages may not sum to totals because of rounding. Cases with missing data on the major or minor are excluded. The number of second majors is greater than the number of first majors because one teacher failed to report a code for the first major, but reported a code for the second major (or minor).

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Table 7.--Accuracy of teachers' self-reports on the number of courses and credit hours they earned in teacher education

Comparison of self-reports and transcript data	Number of courses reported by teacher					Number of credit hours reported by teacher				
	Total	None	1 course	2-3 courses	4 or more courses	Total	None	1-3 credits	4-9 credits	10 or more credits
Undergraduate										
Number of teachers (total)	280	25	7	40	208	228	25	7	39	157
Percent of teachers										
Transcript matches self-report	68	56	29	18	81	58	32	0	8	78
All transcripts received	39	16	29	10	47	37	20	0	3	50
All received counting transfers	6	4	0	3	7	3	4	0	0	4
Some transcripts received	24	36	0	5	27	18	8	0	5	24
Teacher gave underestimate	14	44	57	63	0	22	68	100	69	0
Teacher gave overestimate	18	0	14	20	19	19	0	0	23	22
All transcripts received	3	0	0	5	3	2	0	0	0	3
All received counting transfers	0	0	0	0	0	--	0	0	0	1
Some transcripts received	14	0	14	15	16	17	0	0	23	19
Graduate										
Number of teachers (total)	250	49	17	59	125	196	51	15	33	97
Percent of teachers										
Transcript matches self-report	59	65	29	15	81	64	82	67	33	64
All transcripts received	28	35	24	10	35	34	53	27	12	33
All received counting transfers	4	6	0	2	5	3	4	7	0	2
Some transcripts received	26	24	6	3	41	27	25	33	21	29
Teacher gave underestimate	18	35	35	37	0	12	18	13	39	0
Teacher gave overestimate	23	0	35	47	19	24	0	20	27	36
All transcripts received	8	0	29	12	6	8	0	7	3	14
All received counting transfers	2	0	0	7	1	1	0	0	0	2
Some transcripts received	14	0	6	29	13	15	0	13	24	20

-- Less than 0.5 percent.

NOTE: Percentages may not sum to totals because of rounding. Teachers for whom no transcript data were collected, and teachers who did not state the number of courses or credits taken are excluded. Depending on the questionnaire used, teachers were asked to report either the number of credits or the number of courses, but not both. Courses for education in a specific program area (e.g., mathematics education) should have been included by the teachers.

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Table 8.--Accuracy of teachers' self-reports on the number of courses and credit hours they earned in their main teaching assignment

Comparison of self-reports and transcript data	Number of courses reported by teacher					Number of credit hours reported by teacher					
	Total	None	1-4 courses	5-9 courses	10 or more courses	Total	None	1-10 credits	11-20 credits	21-30 credits	31 or more credits
Undergraduate											
Number of teachers (total)	141	4	13	30	94	111	8	6	13	23	61
Percent of teachers											
Transcript matches self-report . . .	53	50	38	37	61	42	0	33	31	26	57
All transcripts received	26	25	8	10	34	26	0	33	15	13	36
All received counting transfers .	5	25	0	10	3	2	0	0	0	0	3
Some transcripts received . . .	22	0	31	17	23	14	0	0	15	13	18
Teacher gave underestimate. . . .	11	50	38	30	0	17	100	33	23	26	0
Teacher gave overestimate	35	0	23	33	39	41	0	33	46	48	43
All transcripts received	16	0	15	13	17	14	0	17	8	17	15
All received counting transfers .	1	0	0	0	2	2	0	0	8	0	2
Some transcripts received . . .	18	0	8	20	20	25	0	17	31	30	26
Graduate											
Number of teachers (total)	118	25	32	18	43	91	29	22	12	14	14
Percent of teachers											
Transcript matches self-report . . .	42	100	28	22	28	46	93	36	8	29	14
All transcripts received	22	60	13	11	12	27	59	18	8	14	7
All received counting transfers .	3	4	3	6	2	0	0	0	0	0	0
Some transcripts received . . .	17	36	13	6	14	19	34	18	0	14	7
Teacher gave underestimate. . . .	3	0	9	0	0	7	7	0	25	7	0
Teacher gave overestimate	55	0	63	78	72	47	0	64	67	64	86
All transcripts received	21	0	22	33	28	19	0	27	25	29	29
All received counting transfers .	3	0	6	0	5	3	0	5	0	0	14
Some transcripts received . . .	31	0	34	40	44	25	0	32	42	36	43

NOTE: Percentages may not sum to totals because of rounding. Teachers for whom no transcript data were collected, and teachers who did not state the number of courses or credits taken are excluded. Depending on the questionnaire used, teachers were asked to report either the number of credits or the number of courses, but not both. Teachers whose main teaching assignment was in prekindergarten, kindergarten, general elementary, or special education were not asked the number of courses or credits in their primary field.

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Table 9.--Accuracy of teachers' self-reports on the number of courses and credit hours they earned in their second teaching assignment

Comparison of self-reports and transcript data	Number of courses reported by teacher					Number of credit hours reported by teacher					
	Total	None	1-4 courses	5-9 courses	10 or more courses	Total	None	1-10 credits	11-20 credits	21-30 credits	31 or more credits
Undergraduate											
Number of teachers (total)	30	1	10	13	6	29	0	7	7	6	9
Percent of teachers											
Transcript matches self-report	37*	100	40	38	17	14	0	0	14	17	22
All transcripts received	20	100	10	23	17	7	0	0	14	0	11
All received counting transfers	7	0	10	8	0	3	0	0	0	17	0
Some transcripts received	10	0	20	8	0	3	0	0	0	0	11
Teacher gave underestimate	10	0	20	8	0	21	0	14	43	0	22
Teacher gave overestimate	53	0	40	54	83	66	0	86	43	83	56
All transcripts received	23	0	30	15	33	38	0	57	0	50	44
All received counting transfers	3	0	0	8	0	7	0	0	14	17	0
Some transcripts received	27	0	10	31	50	21	0	29	29	17	11
Graduate											
Number of teachers (total)	22	8	7	6	1	19	8	5	3	2	1
Percent of teachers											
Transcript matches self-report	45	100	14	0	100	37	25	60	33	0	100
All transcripts received	23	38	14	0	100	16	13	20	0	0	100
All received counting transfers	14	38	0	0	0	0	0	0	0	0	0
Some transcripts received	9	25	0	0	0	21	13	40	33	0	0
Teacher gave underestimate	5	0	14	0	0	0	0	0	0	0	0
Teacher gave overestimate	50	0	71	100	0	63	75	40	67	100	0
All transcripts received	18	0	14	50	0	37	63	0	33	50	0
All received counting transfers	0	0	0	0	0	5	0	0	0	50	0
Some transcripts received	32	0	57	50	0	21	13	40	33	0	0

NOTE: Percentages may not sum to totals because of rounding. Teachers for whom no transcript data were collected, and teachers who did not state the number of courses or credits taken are excluded. Depending on the questionnaire used, teachers were asked to report either the number of credits or the number of courses, but not both. Teachers whose second teaching assignment was in prekindergarten, general elementary, or special education were not asked the number of courses or credits in their second field. Most teachers did not have a second teaching assignment.

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Table 10--Accuracy of teachers' self-reports on the types of terms in which they took courses

Comparison of self-reports and transcript data	Teacher education				Main teaching assigment				Second teaching assignment			
	Total	Semester	Quarter	Both	Total	Semester	Quarter	Both	Total	Semester	Quarter	Both
Number of teachers (total)	479	305	64	110	200	128	30	42	41	26	9	6
Percent of teachers												
Transcript matches self-report . .	76	93	53	44	77	95	57	36	68	85	44	33
All transcripts received . . .	41	51	27	22	41	52	27	14	37	50	22	0
All received counting transfers	5	5	5	5	5	5	7	2	10	8	0	33
Some transcripts received . .	30	37	22	17	32	38	23	19	22	27	22	0
Transcript doesn't match self-report	24	7	47	56	23	5	43	64	32	15	56	67
All transcripts received . . .	10	4	25	20	10	4	20	19	17	8	56	0
All received counting transfers	1	0	2	5	2	0	0	7	2	0	0	17
Some transcripts received . .	12	3	20	32	12	1	7	38	12	8	0	50

NOTE: Percentages may not sum to totals because of rounding. Only teachers who reported a term type for courses taken in teacher education, or in their main or second teaching assignments (excluding prekindergarten, kindergarten, general elementary, and special education), and for whom transcripts were available were included.

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Table 11--Accuracy of teachers' self-reports on the number of mathematics and science courses taken

Subject area	Undergraduate						Graduate					
	Percent matching exactly		Mean number of courses		Mean difference between self-report and transcript*		Percent matching exactly		Mean number of courses		Mean difference between self-report and transcript*	
	Including reports of no courses	Excluding reports of no courses	Teachers' estimate	From transcripts	Net	Total distance	Including reports of no courses	Excluding reports of no courses	Teachers' estimate	From transcripts	Net	Total distance
Mathematics	30	25	6.5	5.7	0.8	2.1	70	11	1.2	0.8	0.3	0.8
Computer science	61	26	1.6	1.3	0.4	1.0	82	12	0.4	0.2	0.2	0.3
Biology or life science	49	34	3.5	3.2	0.3	1.3	85	8	0.5	0.4	0.1	0.4
Chemistry	66	44	1.8	2.0	-0.1	0.5	88	25	0.8	0.4	0.4	0.5
Physics	71	35	1.8	1.6	0.2	0.6	89	11	0.8	0.9	-0.1	0.5
Earth or space science	62	20	1.1	0.8	0.3	0.6	93	17	0.6	0.4	0.2	0.3
Other natural science	66	8	0.8	0.8	-0.1	1.3	91	14	0.2	0.1	0.0	0.1

*Some teachers overestimated the number of courses, while others underestimated the number. The column labeled "Net" shows the net effect, with positive and negative differences allowed to cancel out. The column labeled "Total distance" shows the total difference in either direction (absolute value) between the teachers' self-reports and the transcripts. Only teachers for whom complete transcript data were available are included.

Table 12.--Percentage of teachers giving accurate responses, by teacher characteristic

Teacher characteristic	Teacher education				Main teaching assignment			
	Undergraduate		Graduate		Undergraduate		Graduate	
	Number of courses	Number of credits	Number of courses	Number of credits	Number of courses	Number of credits	Number of courses	Number of credits
Gender								
Male	64	61	59	76	66	49	68	63
Female	80	67	68	69	63	60	59	65
Recency of bachelor's degree								
In last 10 years	79	60	68	75	62	55	57	71
11-20 years	75	69	65	59	49	48	61	53
Over 20 years ago	73	66	65	72	78	62	67	62
Institutional control								
Public	73	65	71	72	61	55	60	56
Private	78	66	56	64	63	50	60	69

NOTE: Only teachers for whom complete transcript data were available are included.